

Yehuda Ivri et al.
Application No.: 09/551,408
Page 5

PATENT

REMARKS

Present Status of Patent Application

Claim 40 has been amended. Support for the amendment to claim 40 is found in applicant's specification at least at Paragraphs 0055-0056, 0060 and Figures 3, 10 and 11. Claims 40-43 remain pending.

Rejection Under 35 U.S.C. § 103(a)

The Claims 40-43 were rejected under 35 USC §103(a) over *Robertson et al.*, U.S. 5,487,378 in view of *Maehara et al.* U.S. 4,533,082. It was asserted that it would be obvious to one of ordinary skill in the art in view of *Maehara et al* to form an aperture plate in a dome shape, and further that the selection of palladium or an alloy of palladium would be a matter of routine design choice.

For at least the following reasons, neither *Robertson et al.*, nor *Maehara et al.* individually or combined (and applicant further contends their combination is improper) renders applicant's amended claims obvious. Initially, Robertson does not teach suggest or disclose a dome-shaped, or non-planar aperture plate, and **particularly does not teach or suggest such an aperture plate comprised of palladium or palladium alloy**. Maehara also does not teach or suggest a dome-shaped (or non planar) aperture plate comprised of palladium or palladium alloy, **and wherein substantially all of the vibratable, or liquid expelling, portion is dome-shaped**.

A vibrating mesh-type nebulizer generates aerosol through the use of a mesh or aperture plate, so named because it contains a plurality of very small apertures, each of which act as a diaphragm pump, moving at a very high frequency in relation to the liquid to be nebulized. As such, a vibrating mesh aperture plate must stand up to substantial mechanical forces. This is particularly true in the case of vibrating mesh

Yehuda Ivri et al.
Application No.: 09/551,408
Page 6

PATENT

plates which are vibrated by a piezoelectric element attached (directly or indirectly) to an outer periphery of the plate. Effective pumping action requires the mesh plate have sufficient stiffness so that enough pressure is developed to provide the necessary energy to expel liquid droplets. In a typical vibrating mesh nebulizer, a volume of liquid is contained to contact the aperture plate on a supply side thereof, and the liquid is converted to fine droplets and expelled by the pumping action of the plate. This liquid supply imparts against the plate a strong reaction force. The vibration of the aperture plate in the presence of a fluid can be seen as a reciprocating movement with a forward stroke toward the fluid and a rearward stroke away from the fluid. During the forward stroke the fluid applies a force against the aperture plate in the direction opposite the movement. The force of the fluid on the aperture plate is analogous to that of a fluid (air) impinging upon the windshield of a moving vehicle. Due to the high frequency of vibration, this strong reaction force moves against the liquid and thus imposes a load on the plate. In such a circumstance, the center of the plate resists vibrating under the load, due to the resistance resulting from the inertial load of the liquid.

As a result of the force of the fluid force, a flat aperture plate bends slightly upon each vibrational stroke and the actual displacement of the center portion is reduced.

Accordingly, the efficiency of the nebulizer is also reduced. The dome, or non-planar, shape, has far greater bending rigidity when compared to a flat plate of the same thickness, and therefore overcomes this problem with flat aperture plates.

A dome or non-planar shape aperture plate is stiffer and its deflection during the forward stroke is reduced (but not completely eliminated), therefore the effective amplitude at the center is higher and resulting in greater efficiency. The stiffness of the dome-shaped or non-planar aperture plate a greater delivery efficiency and higher aerosol flow. In some embodiments, the stiffness is more important when the aperture plate is comprised of an electroformed palladium or palladium alloy.

Yehuda Ivri et al.
Application No.: 09/551,408
Page 7

PATENT

Because Robertson is devoid of any teaching suggestion or disclosure of a dome-shaped aperture plate and **in particular does not teach suggest or disclose a dome-shape in combination with an electroformed palladium or palladium alloy aperture plate**, applicant continues to contend that Robertson is inapposite, and indeed, teaches away from applicant's claimed invention, thus its combination with Maehara is additionally not supportable. Moreover, as discussed previously, Maehara does not teach, disclose or suggest Maehara an electroformed dome-shaped (or non planar) aperture plate comprised of palladium or palladium alloy, and wherein substantially all of the vibratable, or liquid expelling, portion is dome-shaped.

For these reasons, Applicants submit that claim 40 is allowable over the cited references.

Finally, claims 41-43 are dependent upon claim 40. If independent claim 40 is allowable over the prior art of record, then its dependent claims, are allowable as a matter of law, because these dependent claims contain all features/elements/steps of their respective independent claim. *In re Fine*, 837 F.2d 1071 (Fed. Cir. 1988). Additionally and notwithstanding the foregoing reasons for the allowability of claim 40, these dependent claims recite further features/steps and/or combinations of features/steps (as is apparent by examination of the claims themselves) that are patentably distinct from the prior art of record. Hence, there are other reasons why these dependent claims are allowable.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Yehuda Ivri et al.
Application No.: 09/551,408
Page 8

PATENT

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-283-6790.

Respectfully submitted,

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On behalf of Aerogen, Inc.

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